

SEQUENCE LISTING

(1) GENERAL INFORMATION:

5 (i) APPLICANT: UNITED BIOMEDICAL INC., ET AL.

(ii) TITLE OF INVENTION: ARTIFICIAL T HELPER CELL
EPITOPES AS IMMUNE STIMULATORS FOR SYNTHETIC
EPTIDE IMMUNOGENS

10 (iii) NUMBER OF SEQUENCES: 151

(iv) CORRESPONDENCE ADDRESS:

15 (A) ADDRESSEE: Morgan & Finnegan, L.L.P.
(B) STREET: 345 Park Avenue
(C) CITY: New York
(D) STATE: NY
(E) COUNTRY: USA
(F) ZIP: 10154-0054

20 (v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC Windows

25 (D) SOFTWARE: Word 97

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: TO BE ASSIGNED
(B) FILING DATE: 21-JUNE-1999

30 (C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: 09/100,414
(B) FILING DATE: 20-JUNE-1998

35 (viii) ATTORNEY/AGENT INFORMATION:

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1151-4158
RECEIVED
TECHNICAL
SEP 25 PM 12:01

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 15 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu
1 5 10
Glu Gly Val
15

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Asp Leu Ser Asp Leu Lys Gly Leu Leu Leu His Lys
1 5 10
Leu Asp Gly Leu
15

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 amino acids

(B) TYPE: amino acid

(C) TOPOLOGY: LINEAR

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Glu Ile Ser Glu Ile Arg Gly Ile Ile Ile His Arg
1 5 10
Ile Glu Gly Ile
15

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 amino acids

(B) TYPE: amino acid

(C) TOPOLOGY: LINEAR

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Asp Val Ser Asp Val Lys Gly Val Val Val His Lys
1 5 10
Val Asp Gly Val
15

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 amino acids

(B) TYPE: amino acid

(C) TOPOLOGY: LINEAR

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Asp Phe Ser Asp Phe Lys Gly Phe Phe Phe His Lys
1 5 10
Phe Asp Gly Phe
15

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 15 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
1 5 10
Glu Gly Ile
15

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Met
15

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Leu Ser Glu Ile Lys Gly Val Ile Val His Lys
1 5 10
Leu Glu Gly Val
15

(2) INFORMATION FOR SEQ ID NO:9:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
1 5 10
Glu Thr Ile
15

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Met Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
1 5 10
Glu Gly Met
15

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Leu Thr Glu Met Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Val
15

(2) INFORMATION FOR SEQ ID NO:12:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
1 5 10
Glu Thr Ile
15

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 15 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Met Ser Glu Met Lys Gly Val Ile Val His Lys Met
 1 5 10
 Glu Gly Met
 15

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 15 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Leu Thr Glu Ile Arg Thr Val Ile Val Thr Arg Leu
 1 5 10
 Glu Thr Val
 15

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- 35 (A) LENGTH: 19 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
 1 5 10
 Lys Ile Glu Gly Ile Leu Phe
 15

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Ile Ser Met Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Met Glu Thr Met Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Leu Glu Gly Val Leu Phe
30 15

(2) INFORMATION FOR SEQ ID NO:18:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe
45 15

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 19 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
 1 5 10
 Lys Leu Glu Gly Met Leu Phe
 15

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 19 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 Arg Ile Glu Thr Ile Leu Phe
 15

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 19 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Ile Ser Met Ser Glu Met Lys Gly Val Ile Val His
 1 5 10
 Lys Met Glu Gly Met Leu Phe
 15

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 19 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 Arg Leu Glu Thr Val Leu Phe
 15

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 15 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln
 1 5 10
 Ser Leu Asp
 15

(2) INFORMATION FOR SEQ ID NO:24:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

45 Lys Lys Lys Phe Phe Leu Leu Thr Arg Ile Leu Thr
 1 5 10
 Ile Pro Gln Ser Leu Asp
 15

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 14 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln
1 5 10
Ser Leu

15

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
1 5 10
Leu Pro Gln Ser Leu Asp
15

30

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- 35 (A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Arg Arg Arg Ile Lys Ile Ile Thr Arg Ile Ile Thr
1 5 10
Ile Pro Leu Ser Ile Arg
15

45

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

15 Lys Lys Lys Val Arg Val Val Thr Lys Val Val Thr
1 5 10
Val Pro Ile Ser Val Asp
15

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

30 Lys Lys Lys Phe Phe Phe Phe Thr Lys Phe Phe Thr
1 5 10
Phe Pro Val Ser Phe Asp
15

(2) INFORMATION FOR SEQ ID NO:30:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

45 Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
1 5 10
Leu Pro Phe Ser Leu Asp
15

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp
15

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 17 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile
15

(2) INFORMATION FOR SEQ ID NO:33:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

45 Lys Lys Lys Met Met Thr Met Thr Arg Met Ile Thr
1 5 10
Met Ile Thr Thr Ile Asp
15

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Phe Ile Thr Met Asp Thr Lys Phe Leu Leu Ala Ser
 1 5 10

Thr His Ile Leu
 15

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Lys Lys Lys Phe Ile Thr Met Asp Thr Lys Phe Leu
 1 5 10

Leu Ala Ser Thr His Ile Leu
 15

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

```

      Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu
    1          5         10
5   Glu Gly Val Gly Gly Glu His Trp Ser Tyr Gly Leu
     15           20
      Arg Pro Gly
     25

```

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 28 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Asp Val Ser Asp Val Lys Gly Val Val Val His Lys
1 5 10
Val Asp Gly Val Gly Gly Glu His Trp Ser Tyr Gly
15 20
Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 28 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Asp Phe Ser Asp Phe Lys Gly Phe Phe Phe His Lys
1 5 10
Phe Asp Gly Phe Gly Gly Glu His Trp Ser Tyr Gly
15 20
Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
1 5 10
Glu Gly Ile Gly Gly Glu His Trp Ser Tyr Gly Leu
15 20
Arg Pro Gly
25

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

```

20      Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
      1      5      10
      Glu Thr Met Gly Gly Glu His Trp Ser Tyr Gly Leu
      15      20
25      Arg Pro Gly
      25

```

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

```

40      Leu Ser Glu Ile Lys Gly val Ile Val His Lys Leu
      1      5      10
      Glu Gly Val Gly Gly Glu His Trp Ser Tyr Gly Leu
      15      20
      Arg Pro Gly
      25

```


(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
 1 5 10
 Glu Thr Ile Gly Gly Glu His Trp Ser Tyr Gly Leu
 15 20
 Arg Pro Gly
 25

(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 45 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
 1 5 10
 Thr Tyr Gln Phe Gly Gly Ile Ser Glu Ile Lys Gly
 15 20
 Val Ile Val His Lys Ile Glu Gly Ile Gly Gly Glu
 25 30 35
 His Trp Ser Tyr Gly Leu Arg Pro Gly
 40 45

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 45 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

```

5      Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
      1              5              10
      Thr Tyr Gln Phe Gly Gly Ile Thr Glu Ile Arg Thr
              15              20
10     Val Ile Val Thr Arg Ile Glu Thr Ile Gly Gly Glu
      25              30              35
      His Trp Ser Tyr Gly Leu Arg Pro Gly
              40

```

(2) INFORMATION FOR SEQ ID NO:47:

15

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

```

25     Met Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
      1              5              10
      Glu Gly Met Gly Gly Glu His Trp Ser Tyr Gly Leu
              15              20
30     Arg Pro Gly
      25

```

(2) INFORMATION FOR SEQ ID NO:48:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

5 Leu Thr Glu Met Arg Thr Val Ile Val Thr Arg Met
 1 5 10
 Glu Thr Val Gly Gly Glu His Trp Ser Tyr Gly Leu
 15 20
 Arg Pro Gly
 25

10 (2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

20 Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
 1 5 10
 Glu Thr Ile Gly Gly Glu His Trp Ser Tyr Gly Leu
 15 20
 25 Arg Pro Gly
 25

(2) INFORMATION FOR SEQ ID NO:50:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

40 Met Ser Glu Met Lys Gly Val Ile Val His Lys Met
 1 5 10
 Glu Gly Met Gly Gly Glu His Trp Ser Tyr Gly Leu
 15 20
 Arg Pro Gly
 25

45

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

Leu Thr Glu Ile Arg Thr Val Ile Val Thr Arg Leu
 1 5 10
 Glu Thr Val Gly Gly Glu His Trp Ser Tyr Gly Leu
 15 20
 Arg Pro Gly
 25

20 (2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 45 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
 1 5 10
 Thr Tyr Gln Phe Gly Gly Leu Thr Glu Ile Arg Thr
 15 20
 Val Ile Val Thr Arg Leu Glu Thr Val Gly Gly Glu
 25 30 35
 His Trp Ser Tyr Gly Leu Arg Pro Gly
 40 45

40 (2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

```

5      Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
      1              5              10
      Lys Ile Glu Gly Ile Leu Phe Gly Gly Glu His Trp
              15              20
10     Ser Tyr Gly Leu Arg Pro Gly
      25              30

```

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

```

15     (A) LENGTH: 31 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

```

      Ile Ser Met Thr Glu Ile Arg Thr Val Ile Val Thr
      1              5              10
25     Arg Met Glu Thr Met Leu Phe Gly Gly Glu His Trp
              15              20
      Ser Tyr Gly Leu Arg Pro Gly
      25              30

```

30 (2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

```

35     (A) LENGTH: 31 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

40

```

      Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
      1              5              10
      Lys Leu Glu Gly Val Leu Phe Gly Gly Glu His Trp
              15              20
45     Ser Tyr Gly Leu Arg Pro Gly
      25              30

```

(2) INFORMATION FOR SEQ ID NO:56:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 Arg Ile Glu Thr Ile Leu Phe Gly Gly Glu His Trp
 15 15 20
 Ser Tyr Gly Leu Arg Pro Gly
 25 30

(2) INFORMATION FOR SEQ ID NO:57:

20

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 49 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

25

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

30 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
 1 5 10
 Thr Tyr Gln Phe Gly Gly Ile Ser Ile Ser Glu Ile
 15 20
 Lys Gly Val Ile Val His Lys Ile Glu Gly Ile Leu
 35 25 30 35
 Phe Gly Gly Glu His Trp Ser Tyr Gly Leu Arg Pro
 40 45
 Gly

40 (2) INFORMATION FOR SEQ ID NO:58:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 49 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

45

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

```

5      Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
      1              5              10
      Thr Tyr Gln Phe Gly Gly Ile Ser Ile Thr Glu Ile
              15              20
10     Arg Thr Val Ile Val Thr Arg Ile Glu Thr Ile Leu
      25              30              35
      Phe Gly Gly Glu His Trp Ser Tyr Gly Leu Arg Pro
              40              45
      Gly

```

15 (2) INFORMATION FOR SEQ ID NO:59:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 amino acids

(B) TYPE: amino acid

20 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

```

25     Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
      1              5              10
      Lys Leu Glu Gly Met Leu Phe Gly Gly Glu His Trp
              15              20
30     Ser Tyr Gly Leu Arg Pro Gly
      25              30

```

(2) INFORMATION FOR SEQ ID NO:60:

35 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 47 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
 1 5 10
 5 Thr Tyr Gln Phe Ile Ser Ile Ser Glu Ile Lys Gly
 15 20
 Val Ile Val His Lys Ile Glu Gly Ile Leu Phe Gly
 25 30 35
 10 Gly Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
 40 45

(2) INFORMATION FOR SEQ ID NO:61:

(i) SEQUENCE CHARACTERISTICS:

15 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 25 Arg Ile Glu Thr Ile Leu Phe Gly Gly Glu His Trp
 15 20
 Ser Tyr Gly Leu Arg Pro Gly
 25 30

30 (2) INFORMATION FOR SEQ ID NO:62:

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 49 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

```

    Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
    1          5          10
5   Thr Tyr Gln Phe Gly Gly Ile Ser Ile Thr Glu Ile
    15          20
    Arg Thr Val Ile Val Thr Arg Ile Glu Thr Ile Leu
    25          30          35
10  Phe Gly Gly Glu His Trp Ser Tyr Gly Leu Arg Pro
    40          45
    Gly

```

(2) INFORMATION FOR SEQ ID NO:63:

```

15  (i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 47 amino acids
    (B) TYPE: amino acid
    (D) TOPOLOGY: linear

```

```

20  (ii) MOLECULE TYPE: peptide

```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

```

    Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
    1          5          10
25  Thr Tyr Gln Phe Ile Ser Met Ser Glu Met Lys Gly
    15          20
    Val Ile Val His Lys Met Glu Gly Met Leu Phe Gly
    25          30          35
30  Gly Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
    40          45

```

(2) INFORMATION FOR SEQ ID NO:64:

```

35  (i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 31 amino acids
    (B) TYPE: amino acid
    (D) TOPOLOGY: linear

```

```

40  (ii) MOLECULE TYPE: peptide

```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 5 Arg Leu Glu Thr Val Leu Phe Gly Gly Glu His Trp
 15 20
 Ser Tyr Gly Leu Arg Pro Gly
 25 30

10 (2) INFORMATION FOR SEQ ID NO:65

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65

20 Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln
 1 5 10
 Ser Leu Asp Gly Gly Glu His Trp Ser Tyr Gly Leu
 15 20
 25 Arg Pro Gly
 25

(2) INFORMATION FOR SEQ ID NO:66

30 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 30 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66

40 Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
 1 5 10
 Leu Pro Gln Ser Leu Asp Gly Gly Glu His Trp Ser
 15 20
 Tyr Gly Leu Arg Pro Gly
 25 30
 45

(2) INFORMATION FOR SEQ ID NO:67

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 30 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67

```

Arg Arg Arg Ile Lys Ile Ile Thr Arg Ile Ile Thr
1           5           10
Ile Pro Leu Ser Ile Arg Gly Gly Glu His Trp Ser
15          15          20
Tyr Gly Leu Arg Pro Gly
25          30

```

(2) INFORMATION FOR SEQ ID NO:68

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 30 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68

```

Lys Lys Lys Val Arg Val Val Thr Lys Val Val Thr
1           5           10
Val Pro Ile Ser Val Asp Gly Gly Glu His Trp Ser
15          15          20
Tyr Gly Leu Arg Pro Gly
25          30

```

(2) INFORMATION FOR SEQ ID NO:69

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 30 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69

Lys Lys Lys Phe Phe Phe Phe Thr Lys Phe Phe Thr
 1 5 10
 5 Phe Pro Val Ser Phe Asp Gly Gly Glu His Trp Ser
 15 20
 Tyr Gly Leu Arg Pro Gly
 25 30

10 (2) INFORMATION FOR SEQ ID NO:70

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 30 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70

20 Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
 1 5 10
 Leu Pro Phe Ser Leu Asp Gly Gly Glu His Trp Ser
 15 20
 25 Tyr Gly Leu Arg Pro Gly
 25 30

(2) INFORMATION FOR SEQ ID NO:71:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 30 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

40 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
 1 5 10
 Ile Ile Thr Thr Ile Asp Gly Gly Glu His Trp Ser
 15 20
 Tyr Gly Leu Arg Pro Gly
 25 30

45

(2) INFORMATION FOR SEQ ID NO:72:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

15 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
 1 5 10
 Ile Ile Thr Thr Ile Gly Gly Glu His Trp Ser Tyr
 15 20
 Gly Leu Arg Pro Gly
 25

20 (2) INFORMATION FOR SEQ ID NO:73:

(i) SEQUENCE CHARACTERISTICS:

- 25 (A) LENGTH: 30 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

30 Lys Lys Lys Met Met Thr Met Thr Arg Met Ile Thr
 1 5 10
 Met Ile Thr Thr Ile Asp Gly Gly Glu His Trp Ser
 15 20
 Tyr Gly Leu Arg Pro Gly
 35 25 30

(2) INFORMATION FOR SEQ ID NO:74:

(i) SEQUENCE CHARACTERISTICS:

- 40 (A) LENGTH: 28 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

45

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

Phe Ile Thr Met Asp Thr Lys Phe Leu Leu Ala Ser
 1 5 10
 5 Thr His Ile Leu Gly Gly Glu His Trp Ser Tyr Gly
 15 20
 Leu Arg Pro Gly
 25

10 (2) INFORMATION FOR SEQ ID NO:75:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 46 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
 1 5 10
 Thr Tyr Gln Phe Gly Gly Phe Ile Thr Met Asp Thr
 15 20
 25 Lys Phe Leu Leu Ala Ser Thr His Ile Leu Gly Gly
 25 30 35
 Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
 40 45

30 (2) INFORMATION FOR SEQ ID NO:76:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 35 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

Lys Lys Lys Phe Ile Thr Met Asp Thr Lys Phe Leu
 1 5 10
 Leu Ala Ser Thr His Ile Leu Gly Gly Glu His Trp
 15 20
 45 Ser Tyr Gly Leu Arg Pro Gly
 25 30

(2) INFORMATION FOR SEQ ID NO:77:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 10 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
1 5 10

(2) INFORMATION FOR SEQ ID NO:78:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
Thr Tyr Gln Phe
15

(2) INFORMATION FOR SEQ ID NO:79:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

Pro Pro Xaa Pro Xaa Pro
1 5

(2) INFORMATION FOR SEQ ID NO:80:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 14 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

Ala Gly Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr
 1 5 10
 Ser Cys

(2) INFORMATION FOR SEQ ID NO:81:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
 1 5 10
 Glu Gly Ile Gly Gly Ala Gly Cys Lys Asn Phe Phe
 15 20
 Trp Lys Thr Phe Thr Ser Cys
 25 30

(2) INFORMATION FOR SEQ ID NO:82:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:82:

Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
 1 5 10
 5 Glu Thr Met Gly Gly Ala Gly Cys Lys Asn Phe Phe
 15 20
 Trp Lys Thr Phe Thr Ser Cys
 25 30

10 (2) INFORMATION FOR SEQ ID NO:83:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:83:

Leu Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
 1 5 10
 Glu Gly Val Gly Gly Ala Gly Cys Lys Asn Phe Phe
 15 20
 25 Trp Lys Thr Phe Thr Ser Cys
 25 30

(2) INFORMATION FOR SEQ ID NO:84:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:84:

Ala Gly Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr
 1 5 10
 40 Ser Cys Gly Gly Ile Ser Glu Ile Lys Gly Val Ile
 15 20
 Val His Lys Ile Glu Gly Ile
 25 30
 45

(2) INFORMATION FOR SEQ ID NO:85:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

Ala	Gly	Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr
1				5					10		
Ser	Cys	Gly	Gly	Met	Thr	Glu	Ile	Arg	Thr	Val	Ile
		15					20				
Val	Thr	Arg	Met	Gly	Thr	Met					
25					30						

(2) INFORMATION FOR SEQ ID NO:86:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

Ala	Gly	Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr
1				5					10		
Ser	Cys	Gly	Gly	Leu	Ser	Glu	Ile	Lys	Gly	Val	Ile
		15					20				
Val	His	Lys	Leu	Glu	Gly	Val					
25					30						

(2) INFORMATION FOR SEQ ID NO:87:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 34 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
 1 5 10
 5 Ile Ile Thr Thr Ile Asp Gly Gly Ala Gly Cys Lys
 15 20
 Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys
 25 30

10 (2) INFORMATION FOR SEQ ID NO:88:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 30 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

20 Cys Asn Gln Gly Ser Phe Leu Thr Lys Gly Pro Ser
 1 5 10
 Lys Leu Asn Asp Arg Ala Asp Ser Arg Arg Ser Leu
 15 20
 25 Trp Asp Gln Gly Asn Cys
 25 30

(2) INFORMATION FOR SEQ ID NO:89:

30 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 47 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

40 Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
 1 5 10
 Glu Gly Ile Gly Gly Cys Asn Gln Gly Ser Phe Leu
 15 20
 Thr Lys Gly Pro Ser Lys Leu Asn Asp Arg Ala Asp
 25 30 35
 45 Ser Arg Arg Ser Leu Trp Asp Gln Gly Asn Cys
 40 45

(2) INFORMATION FOR SEQ ID NO:90:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 47 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:90:

```

Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
1           5           10
Glu Thr Met Gly Gly Cys Asn Gln Gly Ser Phe Leu
15          15          20
Thr Lys Gly Pro Ser Lys Leu Asn Asp Arg Ala Asp
25          30          35
Ser Arg Arg Ser Leu Trp Asp Gln Gly Asn Cys
           40          45

```

(2) INFORMATION FOR SEQ ID NO:91:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 47 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:91:

```

Leu Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
1           5           10
Glu Gly Val Gly Gly Cys Asn Gln Gly Ser Phe Leu
35          15          20
Thr Lys Gly Pro Ser Lys Leu Asn Asp Arg Ala Asp
25          30          35
Ser Arg Arg Ser Leu Trp Asp Gln Gly Asn Cys
           40          45

```

(2) INFORMATION FOR SEQ ID NO:92:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 25 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:92:

```

5      Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro
      1              5              10
      His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys
              15              20
10     Cys
      25

```

(2) INFORMATION FOR SEQ ID NO:93:

(i) SEQUENCE CHARACTERISTICS:

```

15     (A) LENGTH: 46 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:93:

```

      Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
      1              5              10
25     Lys Ile Glu Gly Ile Leu Phe Gly Gly Cys Gly Glu
              15              20
      Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro
      25              30              35
30     Arg Ala Leu Met Arg Ser Thr Thr Lys Cys
              40              45

```

(2) INFORMATION FOR SEQ ID NO:94:

(i) SEQUENCE CHARACTERISTICS:

```

35     (A) LENGTH: 46 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:94:

```

      Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
      1           5           10
5      Arg Ile Glu Thr Ile Leu Phe Gly Gly Cys Gly Glu
      15           20
      Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro
      25           30           35
10     Arg Ala Leu Met Arg Ser Thr Thr Lys Cys
      40           45

```

(2) INFORMATION FOR SEQ ID NO:95:

(i) SEQUENCE CHARACTERISTICS:

```

15      (A) LENGTH: 42 amino acids
      (B) TYPE: amino acid
      (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:95:

```

      Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
      1           5           10
25     Glu Gly Ile Gly Gly Cys Gly Glu Thr Tyr Gln Ser
      15           20
      Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met
      25           30           35
30     Arg Ser Thr Thr Lys Cys
      40

```

(2) INFORMATION FOR SEQ ID NO:96:

(i) SEQUENCE CHARACTERISTICS:

```

35      (A) LENGTH: 42 amino acids
      (B) TYPE: amino acid
      (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:96:

Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
 1 5 10
 5 Glu Thr Met Gly Gly Cys Gly Glu Thr Tyr Gln Ser
 15 20
 Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met
 25 30 35
 10 Arg Ser Thr Thr Lys Cys
 40

(2) INFORMATION FOR SEQ ID NO:97:

(i) SEQUENCE CHARACTERISTICS:

15 (A) LENGTH: 42 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:97:

Leu Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
 1 5 10
 25 Glu Gly Val Gly Gly Cys Gly Glu Thr Tyr Gln Ser
 15 20
 Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met
 25 30 35
 30 Arg Ser Thr Thr Lys Cys
 40

(2) INFORMATION FOR SEQ ID NO:98:

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 45 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:98:

5 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
 1 5 10
 Ile Ile Thr Thr Ile Asp Gly Gly Cys Gly Glu Thr
 15 20
 Tyr Gln Ser Arg Val Thr His Pro His Leu Pro Arg
 25 30 35
 10 Ala Leu Met Arg Ser Thr Thr Lys Cys
 40 45

(2) INFORMATION FOR SEQ ID NO:99:

(i) SEQUENCE CHARACTERISTICS:

15 (A) LENGTH: 63 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:99:

25 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
 1 5 10
 Thr Tyr Gln Phe Gly Gly Lys Lys Lys Ile Ile Thr
 15 20
 Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr Ile Asp
 25 30 35
 30 Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr
 40 45
 His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr
 50 55 60
 Thr Lys Cys

35 (2) INFORMATION FOR SEQ ID NO:100:

(i) SEQUENCE CHARACTERISTICS:

40 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:100:

Arg His Lys Gln Lys Ile Val Ala Pro Val Lys Gln
 1 5 10
 5 Thr Leu Pro Pro Ser Val Pro Asn Leu Arg Gly Asp
 15 20
 Leu Gln Val Leu Ala Gln Lys Val Ala Arg Thr Pro
 25 30 35
 Cys Gly

(2) INFORMATION FOR SEQ ID NO:101:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 56 amino acids
 15 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:101:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
 1 5 10
 25 Ile Ile Thr Thr Ile Asp Gly Gly Cys Lys Tyr Gly
 15 20
 Glu Asn Ala Val Thr Asn Val Arg Gly Asp Leu Gln
 25 30 35
 Val Leu Ala Gln Lys Ala Ala Arg Cys Leu Pro Thr
 40 45
 30 Ser Phe Asn Tyr Gly Ala Ile Lys
 50 55

(2) INFORMATION FOR SEQ ID NO:102

35 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 72 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:102

5 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
 1 5 10
 Thr Tyr Gln Phe Gly Gly Lys Lys Lys Ile Ile Thr
 15 20
 Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr Ile Asp
 25 30 35
 10 Gly Gly Cys Thr Tyr Gly Thr Gln Pro Ser Arg Arg
 40 45
 Gly Asp Met Ala Ala Leu Ala Gln Arg Leu Ser Arg
 50 55 60
 Cys Leu Pro Thr Ser Phe Asn Tyr Gly Ala Val Lys
 65 70

(2) INFORMATION FOR SEQ ID NO:103

(i) SEQUENCE CHARACTERISTICS:

20 (A) LENGTH: 4 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:103

25 Asn Ala Asn Pro
 1

(2) INFORMATION FOR SEQ ID NO:104

(i) SEQUENCE CHARACTERISTICS:

30 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

Ile	Ser	Ile	Ser	Glu	Ile	Lys	Gly	Val	Ile	Val	His
1				5					10		
Lys	Ile	Glu	Gly	Ile	Leu	Phe	Lys	Asn	Ala	Asn	Pro
		15					20				
Asn	Ala	Asn	Pro	Asn	Ala	Asn	Pro	Asn	Ala	Asn	Pro
25					30					35	

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

```

20      Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
      1          5          10
      Arg Ile Glu Thr Ile Leu Phe Lys Asn Ala Asn Pro
          15          20
25      Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro
      25          30          35

```

30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

[illegible]

(2) INFORMATION FOR SEQ ID NO:107

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:107

Phe Gly Phe Pro Glu His Leu Leu Val Asp Phe Leu
1 5 10

15 Gln Ser Leu Ser
15

(2) INFORMATION FOR SEQ ID NO:108

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:108

Phe Gly Phe Pro Lys His Leu Leu Val Asp Phe Leu
1 5 10

30 Gln Ser Leu Ser
15

(2) INFORMATION FOR SEQ ID NO:109

35 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 26 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:109

5 Leu Asp Gly Cys Leu Leu Leu Gln Met Asp Phe Gly
 1 5 10
 Phe Pro Lys His Leu Leu Val Asp Phe Leu Gln Ser
 15 20
 Leu Ser
 25

10 (2) INFORMATION FOR SEQ ID NO:110

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 46 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:110

20 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
 1 5 10
 Lys Ile Glu Gly Ile Leu Phe Lys Arg Asp Gly Phe
 15 20
 25 Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Glu His
 25 30 35
 Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
 40 45

30

(2) INFORMATION FOR SEQ ID NO:111

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 46 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:111

```

      Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
      1           5           10
5      Arg Ile Glu Thr Ile Leu Phe Lys Arg Asp Gly Phe
      15           20
      Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Glu His
      25           30           35
10     Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
      40           45

```

(2) INFORMATION FOR SEQ ID NO:112

(i) SEQUENCE CHARACTERISTICS:

```

15      (A) LENGTH: 36 amino acids
      (B) TYPE: amino acid
      (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:112

```

      Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
      1           5           10
25     Lys Ile Glu Gly Ile Leu Phe Lys Phe Gly Phe Pro
      15           20
      Glu His Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
      25           30           35

```

30 (2) INFORMATION FOR SEQ ID NO:113

(i) SEQUENCE CHARACTERISTICS:

```

35      (A) LENGTH: 36 amino acids
      (B) TYPE: amino acid
      (D) TOPOLOGY: linear

```

(ii) MOLECULE TYPE: peptide

	Ile	Ser	Ile	Thr	Glu	Ile	Arg	Thr	Val	Ile	Val	Thr
	1				5					10		
5	Arg	Ile	Glu	Thr	Ile	Leu	Phe	Lys	Phe	Gly	Phe	Pro
			15					20				
	Glu	His	Leu	Leu	Val	Asp	Phe	Leu	Gln	Ser	Leu	Ser
	25					30					35	

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 35 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

20	Lys	Lys	Lys	Ile	Ile	Thr	Ile	Thr	Arg	Ile	Ile	Thr
	1				5					10		
	Ile	Ile	Thr	Thr	Ile	Asp	Lys	Phe	Gly	Phe	Pro	Glu
			15					20				
25	His	Leu	Leu	Val	Asp	Phe	Leu	Gln	Ser	Leu	Ser	
	25					30					35	

30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

[illegible]

(2) INFORMATION FOR SEQ ID NO:116

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:116

Ile	Ser	Ile	Ser	Glu	Ile	Lys	Gly	Val	Ile	Val	His
1				5				10			
Lys	Ile	Glu	Gly	Ile	Leu	Phe	Lys	Phe	Gly	Phe	Pro
		15					20				
Lys	His	Leu	Leu	Val	Asp	Phe	Leu	Gln	Ser	Leu	Ser
25					30					35	

(2) INFORMATION FOR SEQ ID NO:117

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:117

Ile	Ser	Ile	Thr	Glu	Ile	Arg	Thr	Val	Ile	Val	Thr
1				5				10			
Arg	Ile	Glu	Thr	Ile	Leu	Phe	Lys	Phe	Gly	Phe	Pro
		15					20				
Lys	His	Leu	Leu	Val	Asp	Phe	Leu	Gln	Ser	Leu	Ser
25					30					35	

(2) INFORMATION FOR SEQ ID NO:118

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 46 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:118

5 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
 1 5 10
 Lys Ile Glu Gly Ile Leu Phe Lys Leu Asp Gly Cys
 15 20
 Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Lys His
 25 30 35
 10 Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
 40 45

(2) INFORMATION FOR SEQ ID NO:119

15 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 46 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:119

25 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 Arg Ile Glu Thr Ile Leu Phe Lys Leu Asp Gly Cys
 15 20
 Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Lys His
 25 30 35
 30 Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
 40 45

(2) INFORMATION FOR SEQ ID NO:120:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 35 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:120:

Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
 1 5 10
 5 Lys Ile Glu Gly Ile Leu Phe Pro Pro Xaa Pro Xaa
 15 20
 Pro Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
 25 30 35

10 (2) INFORMATION FOR SEQ ID NO:121:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 35 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:121:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 Arg Ile Glu Thr Ile Leu Phe Pro Pro Xaa Pro Xaa
 15 20
 25 Pro Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
 25 30 35

(2) INFORMATION FOR SEQ ID NO:122:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 34 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:122:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
 1 5 10
 40 Ile Ile Thr Thr Ile Asp Pro Pro Xaa Pro Xaa Pro
 15 20
 Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
 25 30
 45

(2) INFORMATION FOR SEQ ID NO:123:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:123:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10

Arg Leu Glu Thr Val Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:124:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:124:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10

Arg Ile Glu Thr Ile Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:125:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:125:

5 Glu Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn
 1 5 10
 Asn Thr Arg Lys Ser Ile Arg Ile Gly Pro Gly Gln
 15 20
 Ala Phe Tyr Ala Thr Gly Asp
 25 30

10 (2) INFORMATION FOR SEQ ID NO:126:

(i) SEQUENCE CHARACTERISTICS:

15 (A) LENGTH: 51 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

20 (A) NAME/KEY: Modified site
 (B) LOCATION: 22
 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:126:

25 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
 1 5 10
 Lys Ile Glu Gly Ile Leu Phe Xaa Glu Ser Val Glu
 15 20
 30 Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
 25 30 35
 Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
 40 48
 Thr Gly Asp
 35 50

(2) INFORMATION FOR SEQ ID NO:127:

(i) SEQUENCE CHARACTERISTICS:

40 (A) LENGTH: 51 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

45

(ix) FEATURE:

(A) NAME/KEY: Modified site

(B) LOCATION: 22

(C) OTHER INFORMATION: /note= "(ε-N)Lys"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:127:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 10 Arg Ile Glu Thr Ile Leu Phe Xaa Glu Ser Val Glu
 15 20
 Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
 25 30 35
 15 Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
 40 48
 Thr Gly Asp
 50

(2) INFORMATION FOR SEQ ID NO:128:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 51 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

25

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified site

(B) LOCATION: 20

(C) OTHER INFORMATION: /note= "(ε-N)Lys"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:128:

35 Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 Arg Leu Glu Thr Val Leu Phe Xaa Glu Ser Val Glu
 15 20
 40 Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
 25 30 35
 Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
 40 48
 Thr Gly Asp
 50

(2) INFORMATION FOR SEQ ID NO:129:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 51 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified site

(B) LOCATION: 20

(C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:129:

```

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1          5          10
Arg Ile Glu Thr Val Ile Phe Xaa Glu Ser Val Glu
15          20
Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
25          30          35
Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
40          48
Thr Gly Asp
50

```

(2) INFORMATION FOR SEQ ID NO:130:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 9 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:130:

```

Lys Ser Ser Gly Lys Leu Ile Ser Leu
1          5

```

(2) INFORMATION FOR SEQ ID NO:131:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 9 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:131:

Cys Asn Gly Arg Leu Tyr Cys Gly Pro
1 5

(2) INFORMATION FOR SEQ ID NO:132:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:132:

Cys Gly Thr Lys Leu Val Cys Phe Ala Ala
1 5 10

(2) INFORMATION FOR SEQ ID NO:133:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 9 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:133:

Lys Arg Ile Val Ile Gly Pro Gln Thr
1 5

(2) INFORMATION FOR SEQ ID NO:134:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 9 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:134:

Cys Ala Gly Gly Leu Thr Cys Ser Val
1 5

(2) INFORMATION FOR SEQ ID NO:135:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 11 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:135:

Cys Ser Gly Arg Leu Tyr Cys His Glu Ser Trp
1 5 10

(2) INFORMATION FOR SEQ ID NO:136:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 29 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified site

(B) LOCATION: 10

(C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:136:

Lys Ser Ser Gly Lys Leu Ile Ser Leu Xaa Ile Ser
 1 5 10
 5 Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
 15 20
 Glu Gly Ile Leu Phe
 25

10 (2) INFORMATION FOR SEQ ID NO:137:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

20 (A) NAME/KEY: Modified site
 (B) LOCATION: 10
 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:137:

25 Lys Ser Ser Gly Lys Leu Ile Ser Leu Xaa Ile Ser
 1 5 10
 Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
 15 20
 30 Glu Thr Ile Leu Phe
 25

(2) INFORMATION FOR SEQ ID NO:138:

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified site
 (B) LOCATION: 10
 45 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:138:

```

      Cys Asn Gly Arg Leu Tyr Cys Gly Pro Xaa Ile Ser
      1           5           10
5     Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
      15           20
      Glu Gly Ile Leu Phe
      25

```

10 (2) INFORMATION FOR SEQ ID NO:139:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 20 (A) NAME/KEY: Modified site
 (B) LOCATION: 10
 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:139:

```

      Cys Asn Gly Arg Leu Tyr Cys Gly Pro Xaa Ile Ser
      1           5           10
      Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
      15           20
30     Glu Thr Ile Leu Phe
      25

```

(2) INFORMATION FOR SEQ ID NO:140:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 30 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 (A) NAME/KEY: Modified site
 (B) LOCATION: 11
 45 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:140:

```

      Cys Gly Thr Lys Leu Val Cys Phe Ala Ala Xaa Ile
      1           5           10
5     Ser Ile Ser Glu Ile Lys Gly Val Ile Val His Lys
      15           20
      Ile Glu Gly Ile Leu Phe
      25           30

```

10 (2) INFORMATION FOR SEQ ID NO:141:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 30 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 20 (A) NAME/KEY: Modified site
 (B) LOCATION: 11
 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:141:

```

25     Cys Gly Thr Lys Leu Val Cys Phe Ala Ala Xaa Ile
      1           5           10
      Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg
      15           20
30     Ile Glu Thr Ile Leu Phe
      25           30

```

(2) INFORMATION FOR SEQ ID NO:142:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 (A) NAME/KEY: Modified site
 (B) LOCATION: 10
 45 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:142:

```

    Lys Arg Ile Val Ile Gly Pro Gln Thr Xaa Ile Ser
    1           5           10
5   Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
    15           20
    Glu Gly Ile Leu Phe
    25

```

10 (2) INFORMATION FOR SEQ ID NO:143:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 20 (A) NAME/KEY: Modified site
 (B) LOCATION: 10
 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:143:

```

25   Lys Arg Ile Val Ile Gly Pro Gln Thr Xaa Ile Ser
    1           5           10
    Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
    15           20
30   Glu Thr Ile Leu Phe
    25

```

(2) INFORMATION FOR SEQ ID NO:144:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:
 (A) NAME/KEY: Modified site
 (B) LOCATION: 10
 45 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:144:

Cys Ala Gly Gly Leu Thr Cys Ser Val Xaa Ile Ser
 1 5 10
 5 Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
 15 20
 Glu Gly Ile Leu Phe
 25

10 (2) INFORMATION FOR SEQ ID NO:145:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 29 amino acids
 (B) TYPE: amino acid
 15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

20 (A) NAME/KEY: Modified site
 (B) LOCATION: 10
 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:145:

25 Cys Ala Gly Gly Leu Thr Cys Ser Val Xaa Ile Ser
 1 5 10
 Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
 15 20
 30 Glu Thr Ile Leu Phe
 25

(2) INFORMATION FOR SEQ ID NO:146:

35 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified site
 (B) LOCATION: 12
 45 (C) OTHER INFORMATION: /note= "(ε-N)Lys"

```

      Cys Ser Gly Arg Leu Tyr Cys His Glu Ser Trp Xaa
1      5      10
5      Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
      15      20
      Lys Ile Glu Gly Ile Leu Phe
      25      30

```

15 (1) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

```

20      (ix) FEATURE:
      (A) NAME/KEY: Modified site
      (B) LOCATION: 12
      (C) OTHER INFORMATION: /note= "(ε-N)Lys"

```

	Cys	Ser	Gly	Arg	Leu	Tyr	Cys	His	Glu	Ser	Trp	Xaa
	1				5					10		
	Ile	Ser	Ile	Thr	Glu	Ile	Arg	Thr	Val	Ile	Val	Thr
			15					20				
30	Arg	Ile	Glu	Gly	Ile	Leu	Phe					
	25					30						

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 52 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

[illegible]

15

(A) LENGTH: 52 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

20

25

25	Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr	
	1 5 10	
	Arg Ile Glu Thr Ile Leu Phe Gly Gly Glu Ser Val	
	15 20	
	Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg	
30	25 30 36	
	Lys Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr	
	40 45	
	Ala Thr Gly Asp	
	50	

35

40

(A) LENGTH: 50 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified site

(B) LOCATION: 20

(C) OTHER INFORMATION: /note= "(ε-N)Lys"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:150:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 10 Arg Leu Glu Thr Val Leu Phe Xaa Glu Ser Val Glu
 15 20
 Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
 25 30 35
 15 Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
 40 48
 Thr Gly
 50

(2) INFORMATION FOR SEQ ID NO:151:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 50 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

25

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified site

(B) LOCATION: 20

(C) OTHER INFORMATION: /note= "(ε-N)Lys"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:151:

35 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
 1 5 10
 Arg Ile Glu Thr Val Ile Phe Xaa Glu Ser Val Glu
 15 20
 40 Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
 25 30 35
 Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
 40 48
 Thr Gly
 50

45